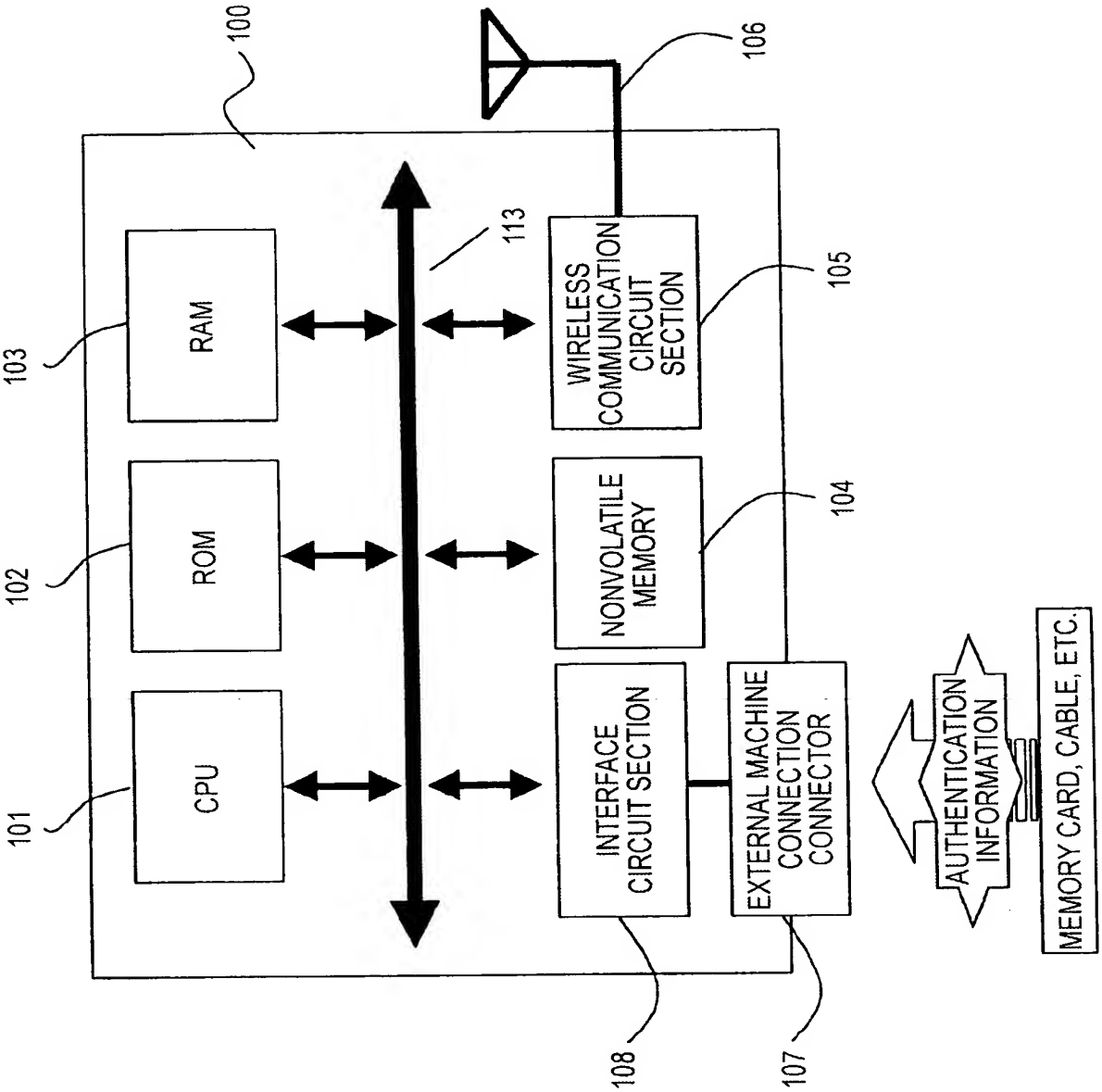

100
106
113
103
RAM
WIRELESS COMMUNICATION CIRCUIT SECTION
105
102
ROM
NONVOLATILE MEMORY
104
101
CPU
INTERFACE CIRCUIT SECTION
EXTERNAL MACHINE CONNECTION CONNECTOR
AUTHENTICATION INFORMATION
MEMORY CARD, CABLE, ETC.
108
107

FIG. 1

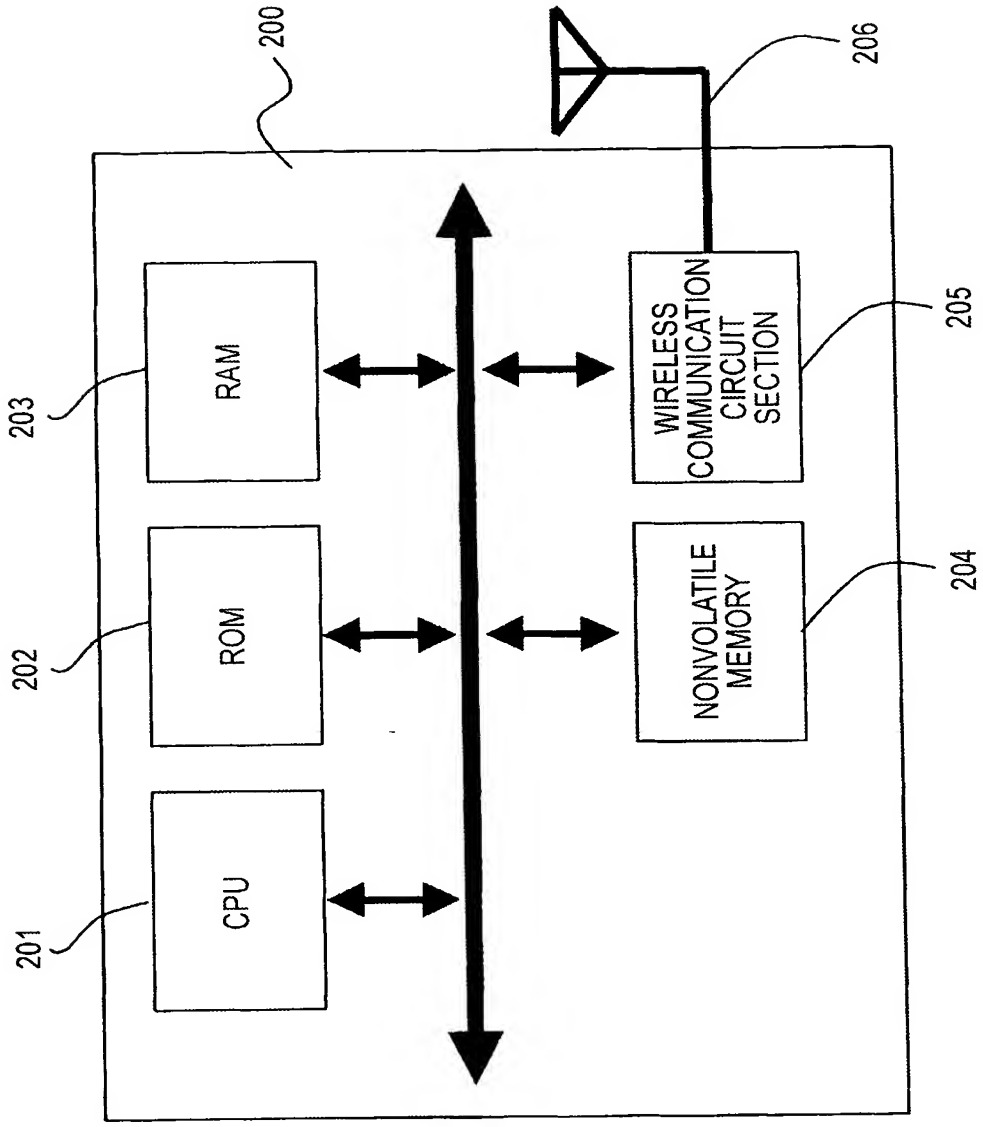

200
206
RAM
203
ROM
202
CPU
201
WIRELESS COMMUNICATION CIRCUIT SECTION
205
NONVOLATILE MEMORY
204

FIG. 2

FIG. 3

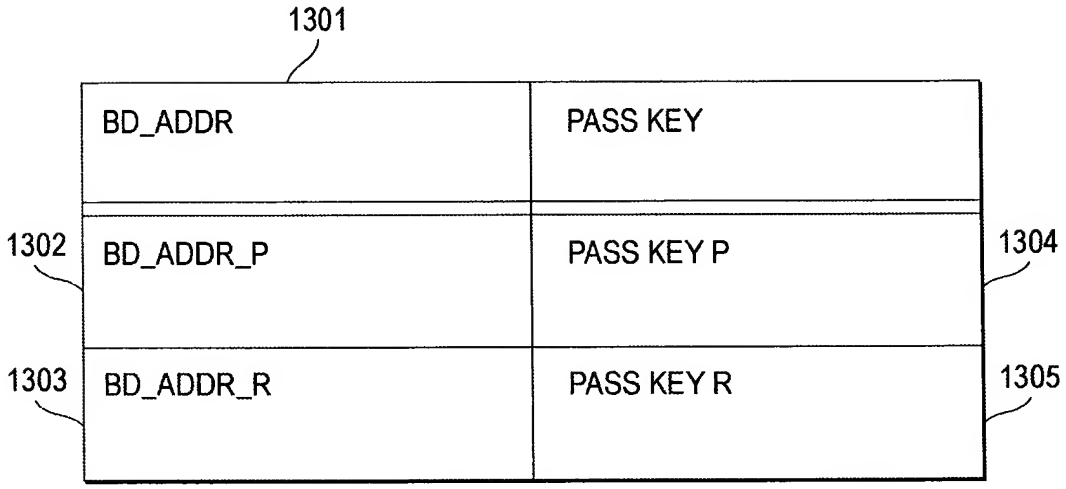

1301
BD_ADDR
PASS KEY
1302
BD_ADDR_P
PASS KEY P
1304
1303
BD_ADDR_R
PASS KEY R
1305

FIG. 4

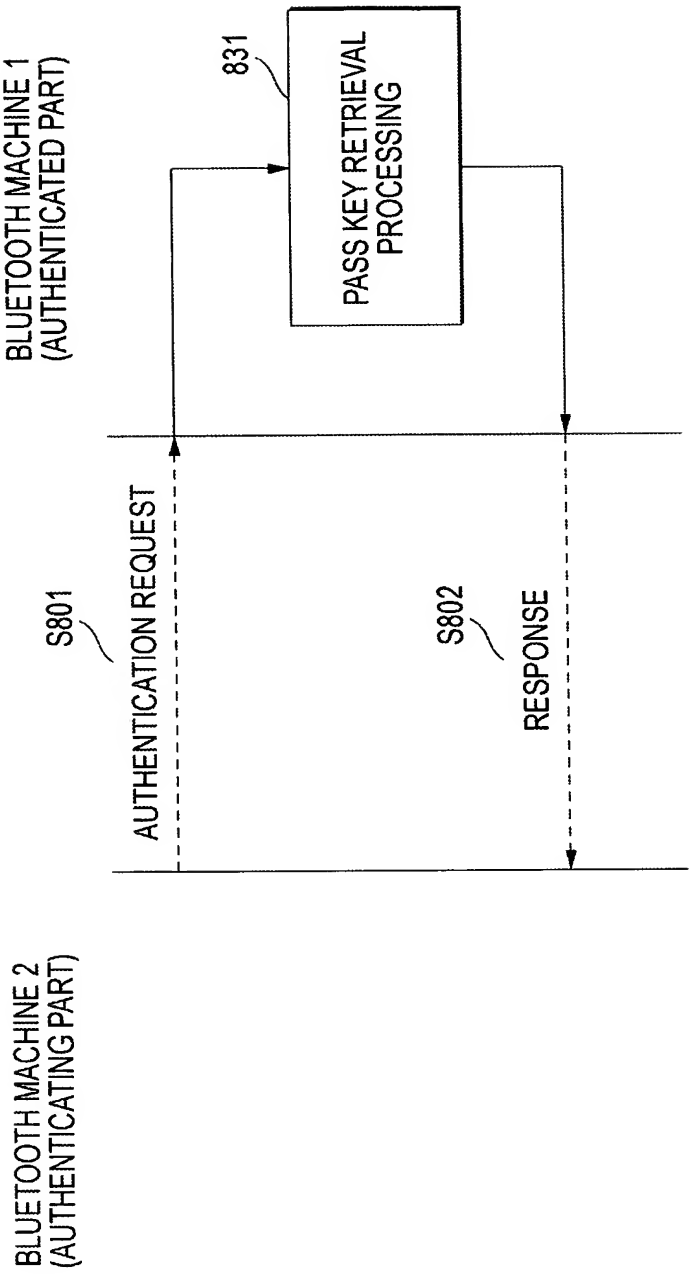

BLUETOOTH MACHINE 1
(AUTHENTICATED PART)
831
PASS KEY RETRIEVAL PROCESSING
S801
AUTHENTICATION REQUEST
S802
RESPONSE
BLUETOOTH MACHINE 2
(AUTHENTICATING PART)

FIG. 5

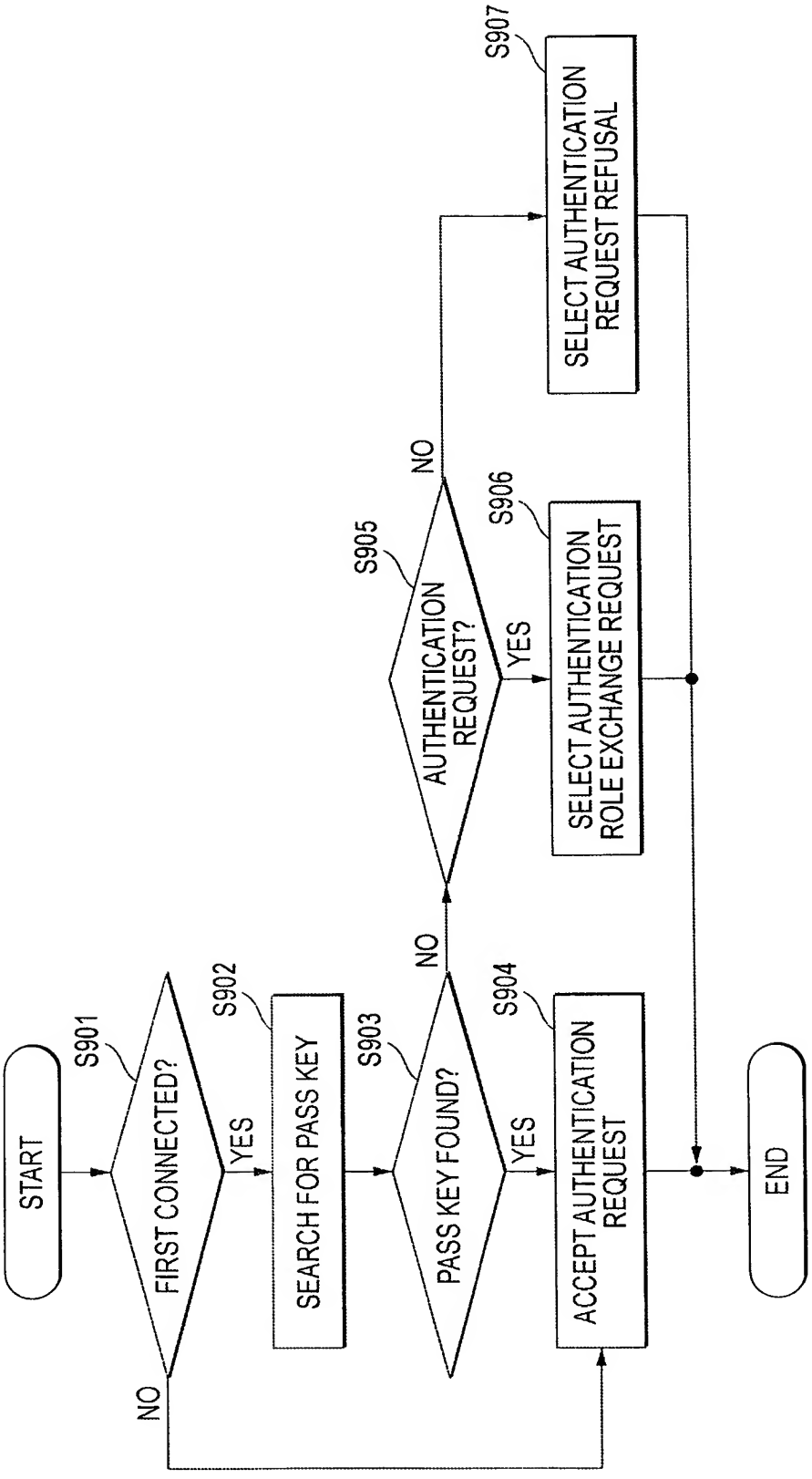

START
S901
FIRST CONNECTED?
YES
NO
S902
SEARCH FOR PASS KEY
S903
PASS KEY FOUND?
YES
NO
S904
ACCEPT AUTHENTICATION REQUEST
S905
AUTHENTICATION REQUEST?
YES
NO
S906
SELECT AUTHENTICATION ROLE EXCHANGE REQUEST
S907
SELECT AUTHENTICATION REQUEST REFUSAL
END

FIG. 6

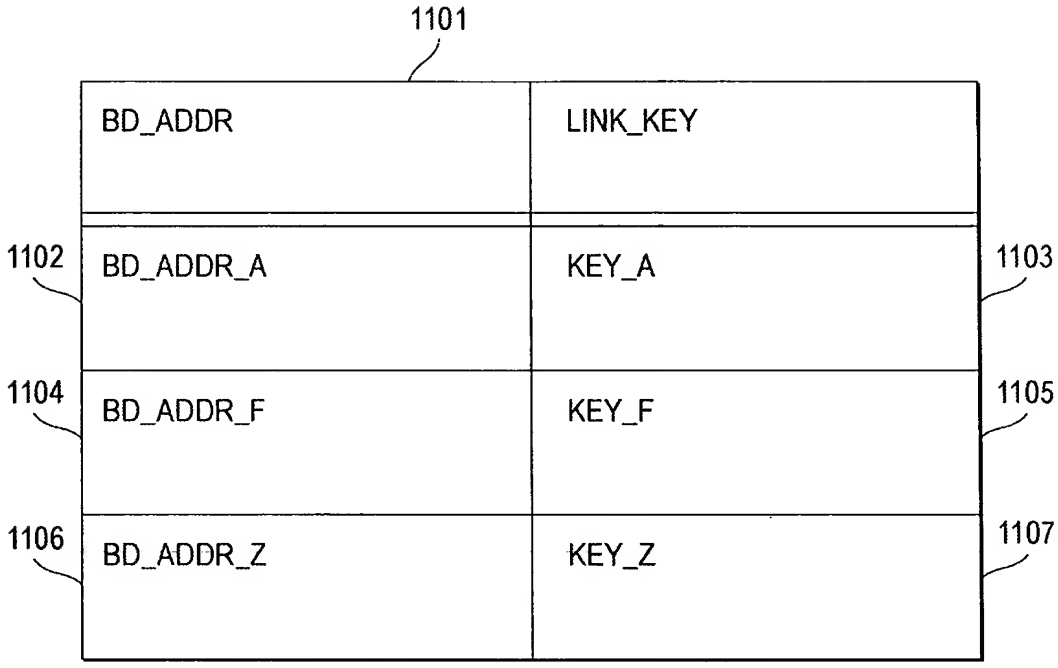

1101
BD_ADDR
LINK_KEY
1102
BD_ADDR_A
KEY_A
1103
1104
BD_ADDR_F
KEY_F
1105
1106
BD_ADDR_Z
KEY_Z
1107

FIG. 7

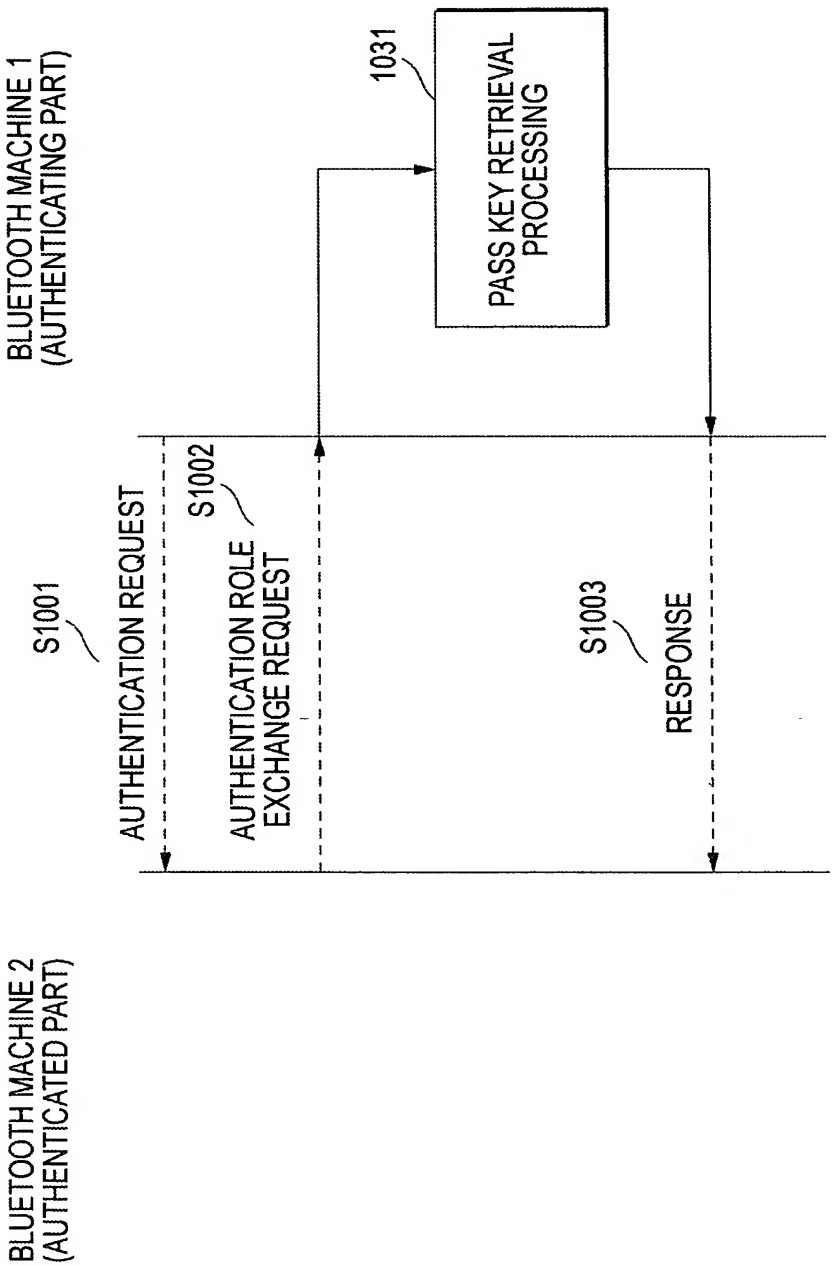

BLUETOOTH MACHINE 1
(AUTHENTICATING PART)
BLUETOOTH MACHINE 2
(AUTHENTICATED PART)
1031
PASS KEY RETRIEVAL PROCESSING
S1001
AUTHENTICATION REQUEST
S1002
AUTHENTICATION ROLE EXCHANGE REQUEST
S1003
RESPONSE

FIG. 8

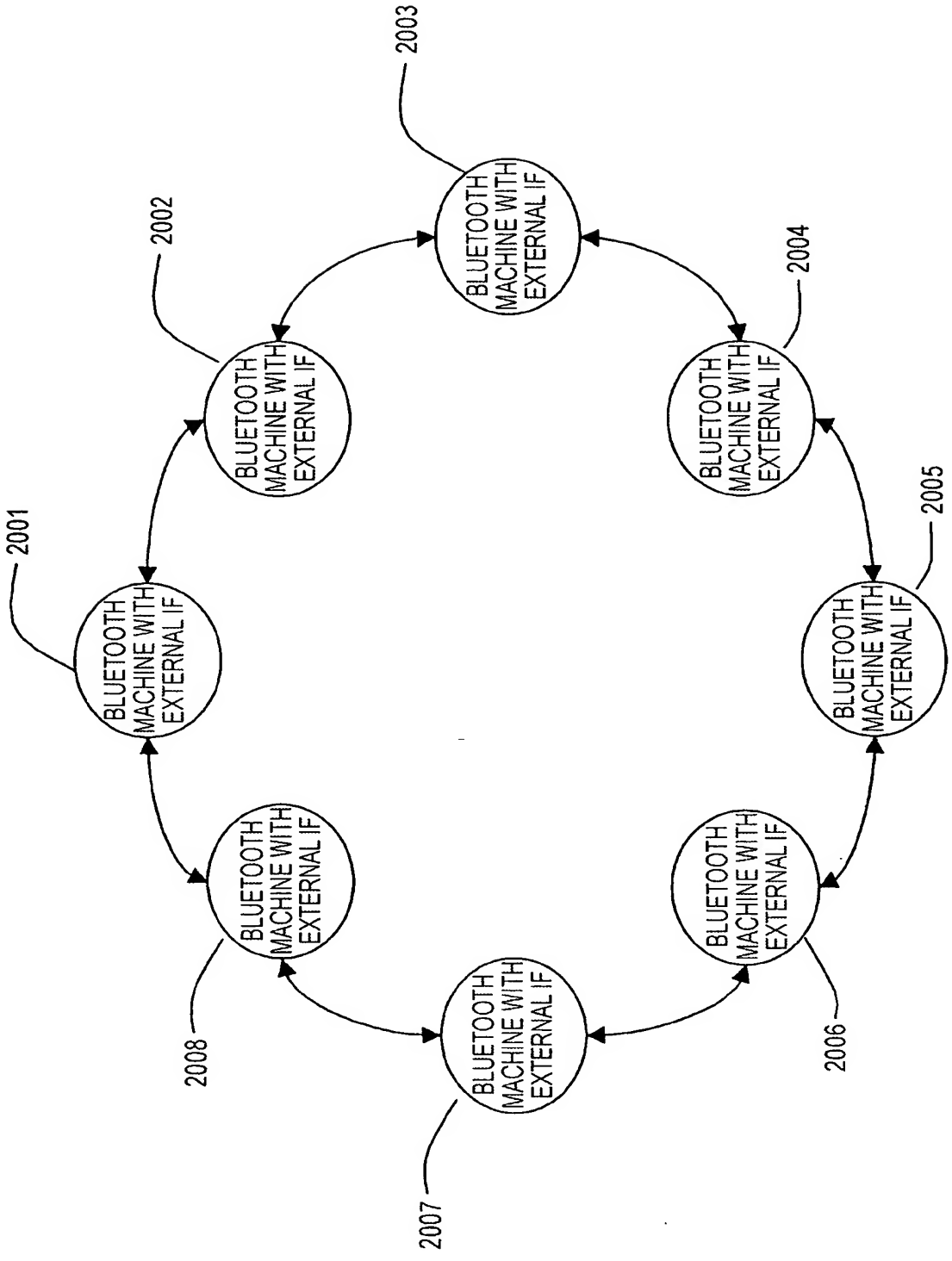

BLUETOOTH MACHINE WITH EXTERNAL IF
2001
2002
2003
2004
2005
2006
2007
2008

FIG. 9

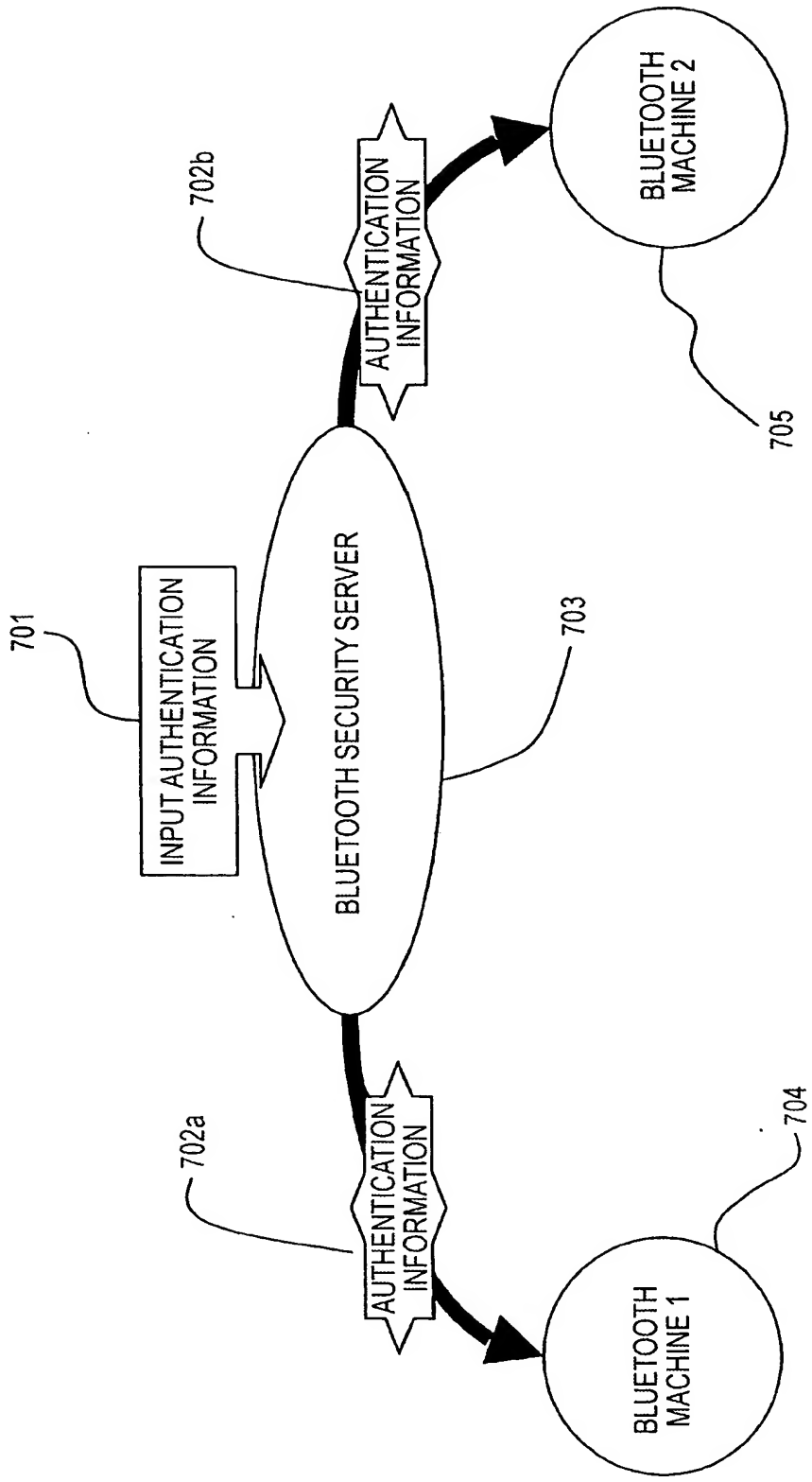

701
INPUT AUTHENTICATION INFORMATION
BLUETOOTH SECURITY SERVER
703
702b
AUTHENTICATION INFORMATION
BLUETOOTH MACHINE 2
705
702a
AUTHENTICATION INFORMATION
BLUETOOTH MACHINE 1
704

FIG. 10

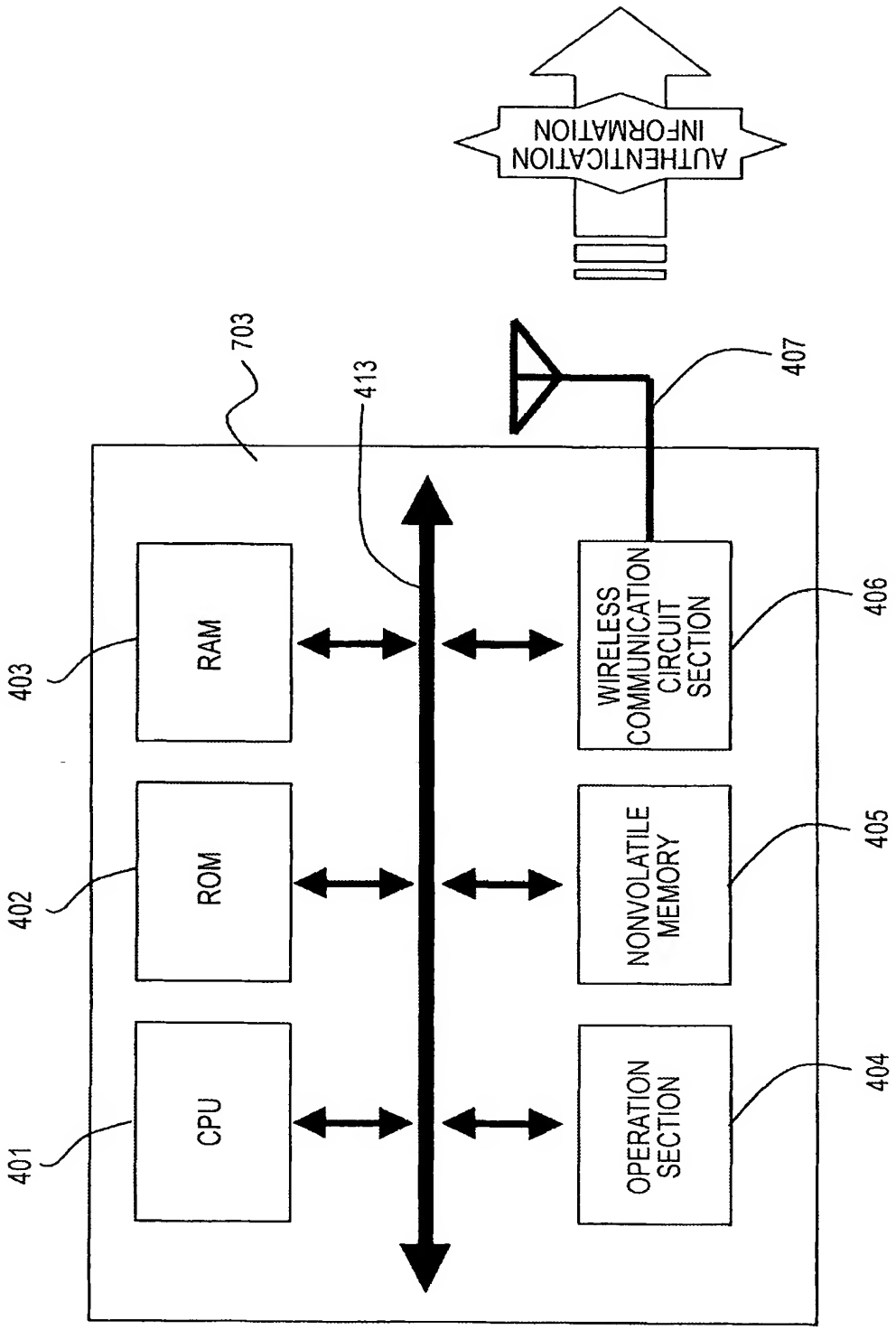

AUTHENTICATION INFORMATION
703
413
407
403
RAM
406
WIRELESS COMMUNICATION CIRCUIT SECTION
402
ROM
405
NONVOLATILE MEMORY
401
CPU
404
OPERATION SECTION

FIG. 11

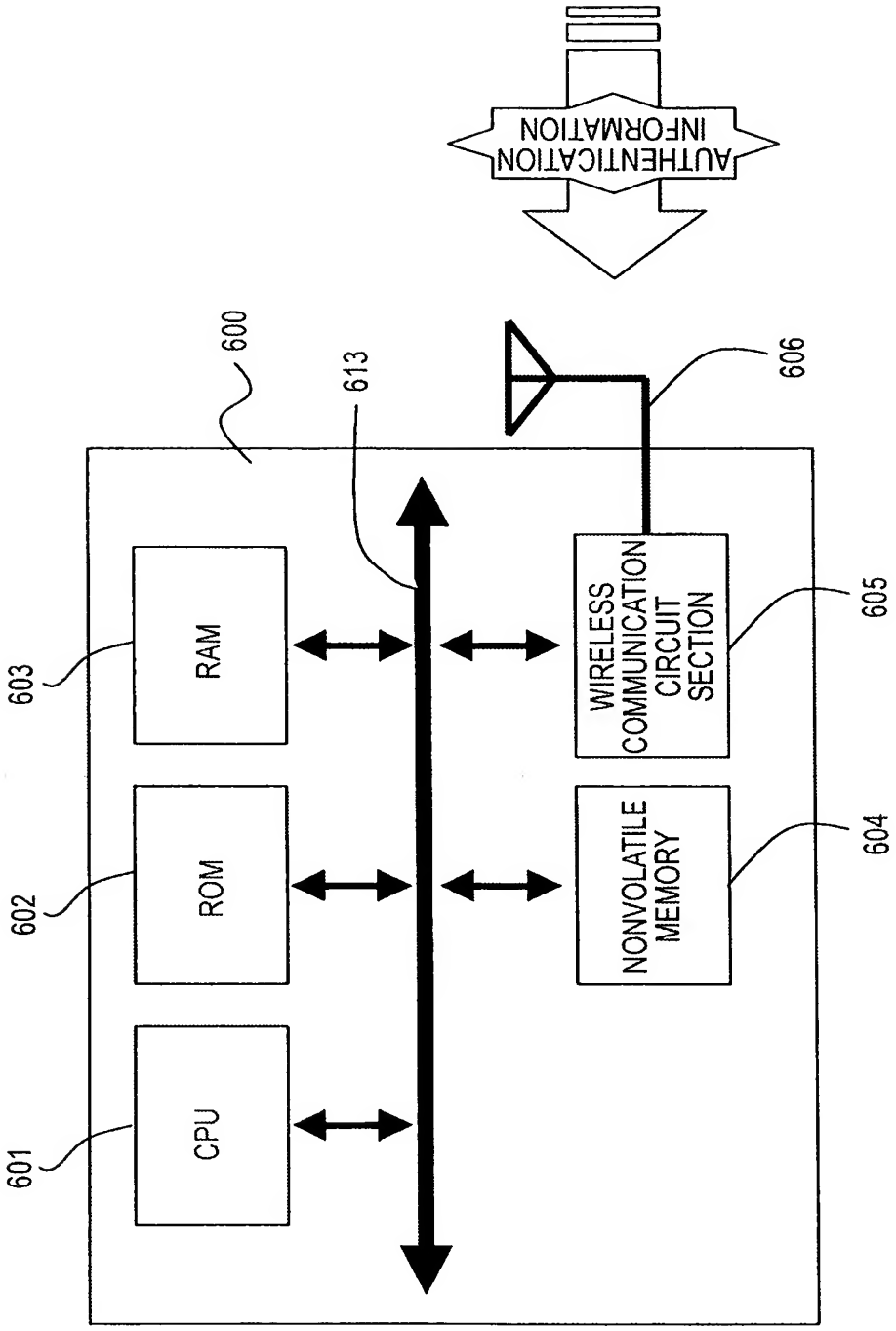

AUTHENTICATION INFORMATION
600
613
606
603
RAM
602
ROM
601
CPU
WIRELESS COMMUNICATION CIRCUIT SECTION
605
NONVOLATILE MEMORY
604

FIG. 12

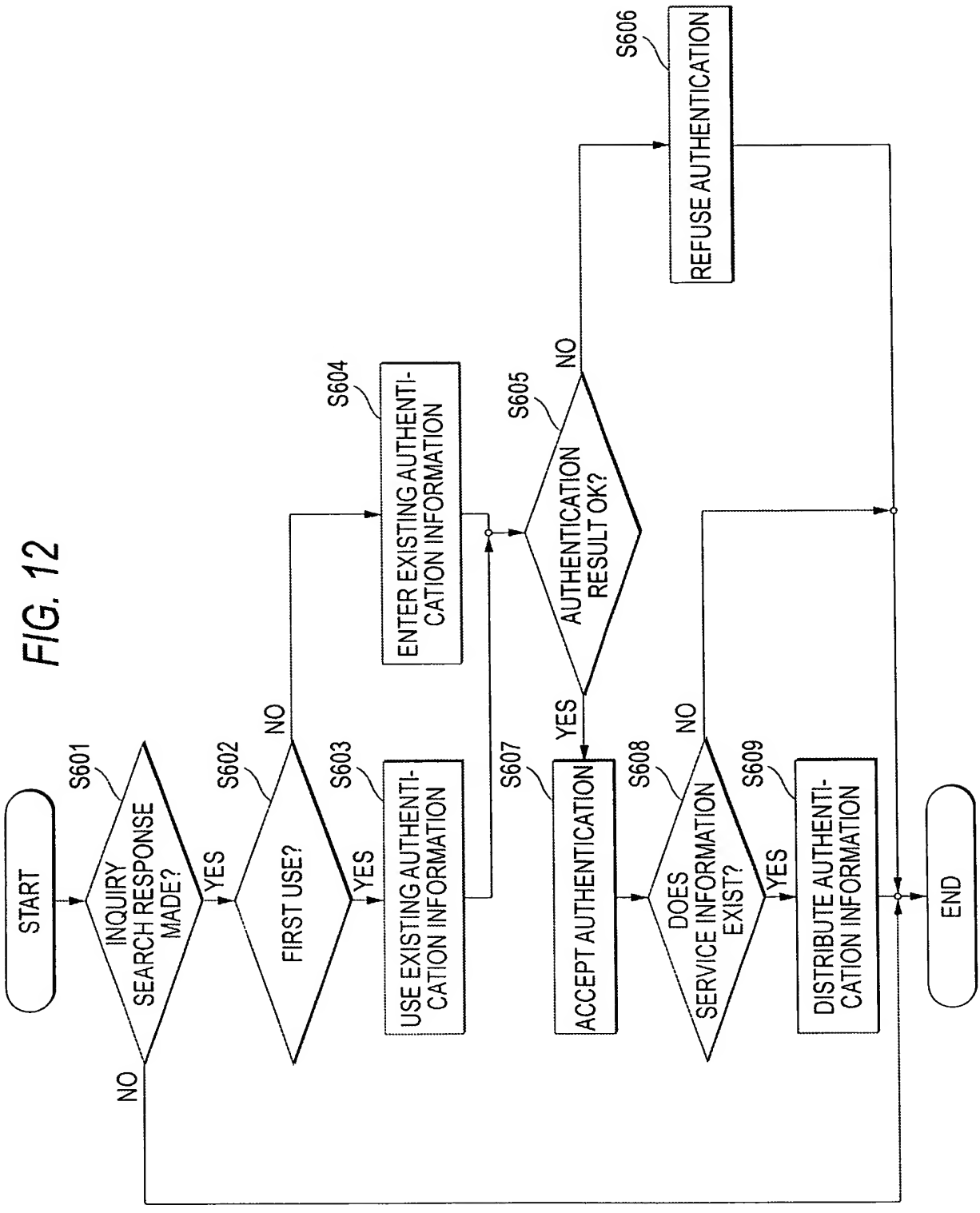

START
S601
INQUIRY SEARCH RESPONSE MADE?
YES
NO
S602
FIRST USE?
YES
NO
S603
USE EXISTING AUTHENTI-CATION INFORMATION
S604
ENTER EXISTING AUTHENTI-CATION INFORMATION
S605
AUTHENTICATION RESULT OK?
YES
NO
S606
REFUSE AUTHENTICATION
S607
ACCEPT AUTHENTICATION
S608
DOES SERVICE INFORMATION EXIST?
YES
NO
S609
DISTRIBUTE AUTHENTI-CATION INFORMATION
END

FIG. 13

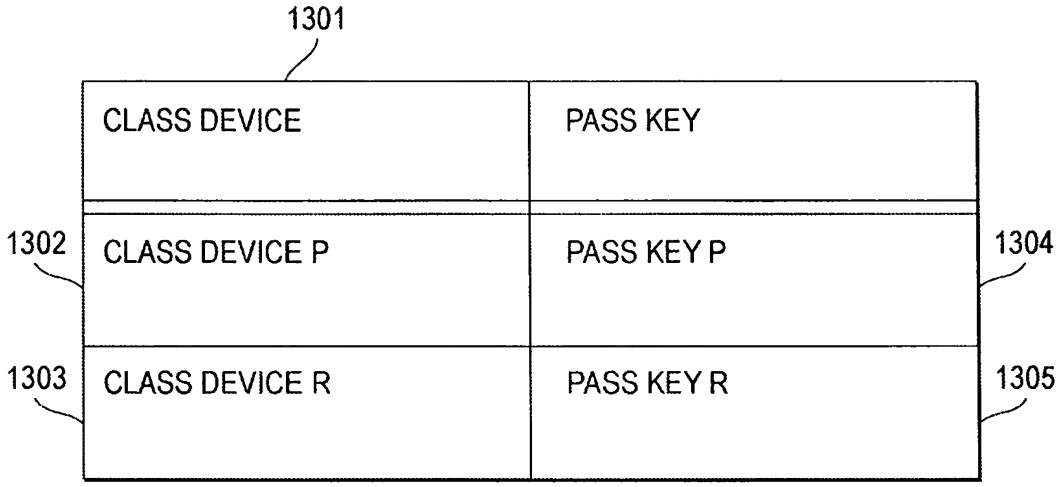

1301
CLASS DEVICE
PASS KEY
1302
CLASS DEVICE P
PASS KEY P
1304
1303
CLASS DEVICE R
PASS KEY R
1305

FIG. 14

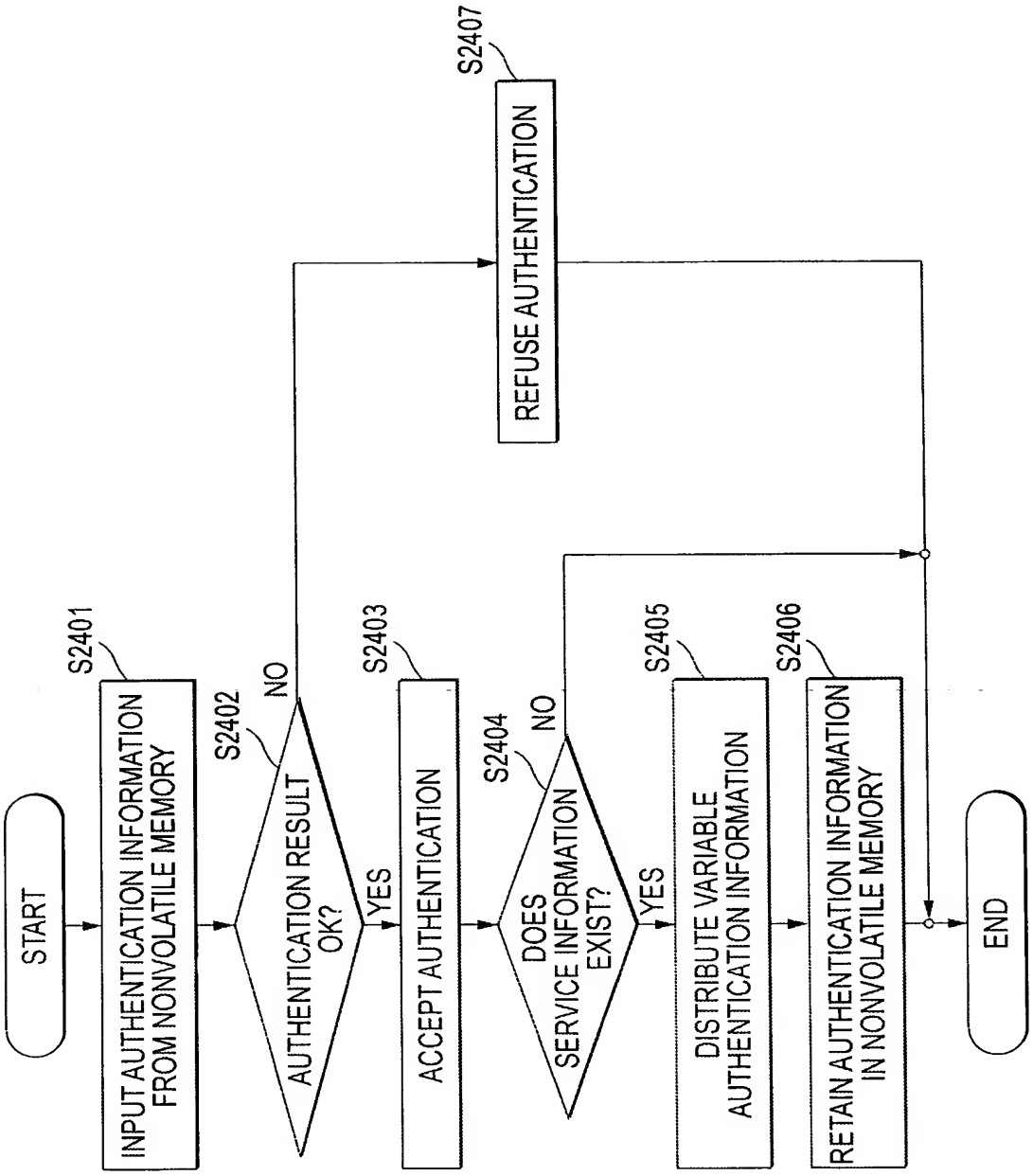

START
S2401
INPUT AUTHENTICATION INFORMATION FROM NONVOLATILE MEMORY
S2402
AUTHENTICATION RESULT OK?
NO
YES
S2407
REFUSE AUTHENTICATION
S2403
ACCEPT AUTHENTICATION
S2404
DOES SERVICE INFORMATION EXIST?
NO
YES
S2405
DISTRIBUTE VARIABLE AUTHENTICATION INFORMATION
S2406
RETAIN AUTHENTICATION INFORMATION IN NONVOLATILE MEMORY
END

FIG. 15

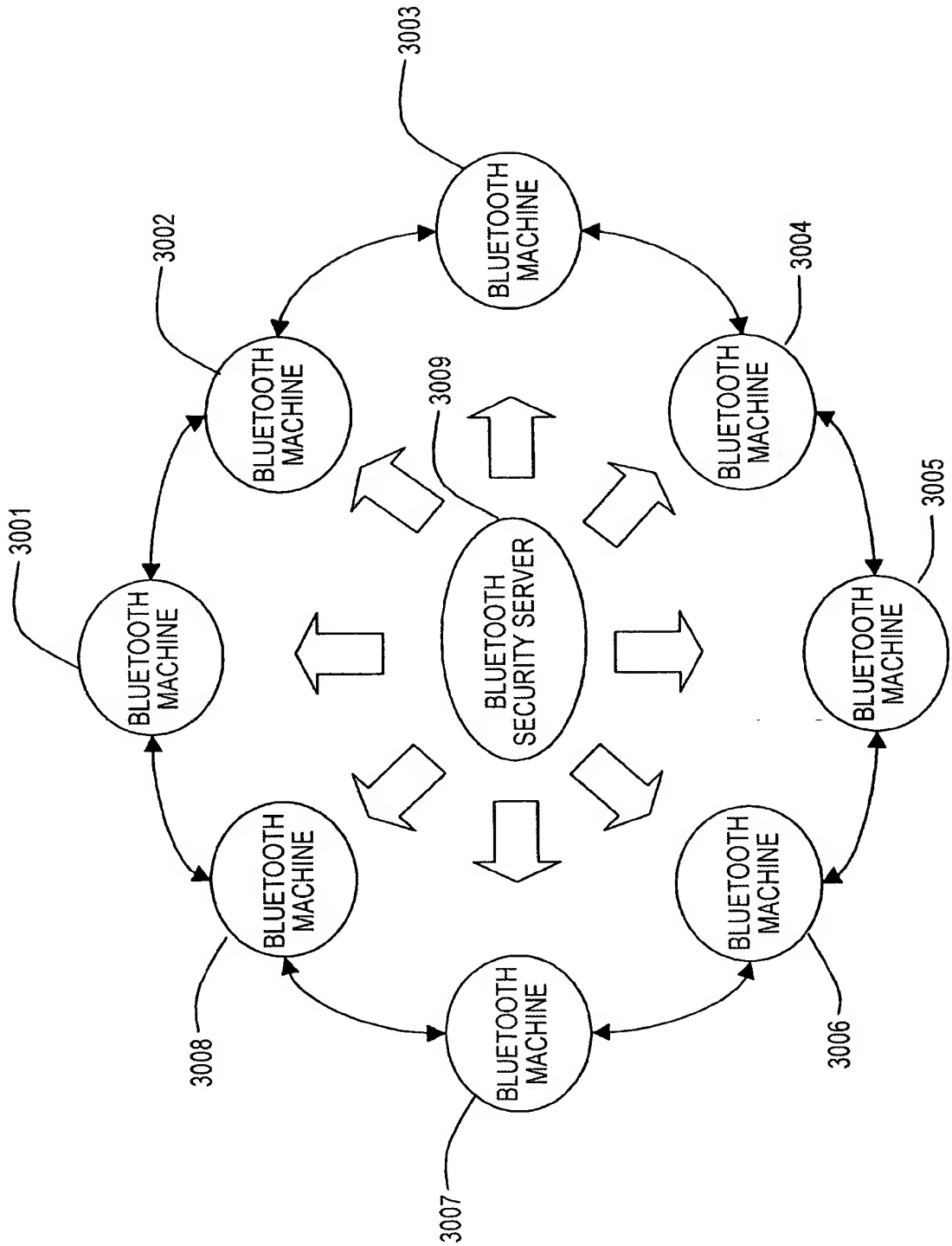

BLUETOOTH SECURITY SERVER
3009
BLUETOOTH MACHINE
3001
BLUETOOTH MACHINE
3002
BLUETOOTH MACHINE
3003
BLUETOOTH MACHINE
3004
BLUETOOTH MACHINE
3005
BLUETOOTH MACHINE
3006
BLUETOOTH MACHINE
3007
BLUETOOTH MACHINE
3008

FIG. 16

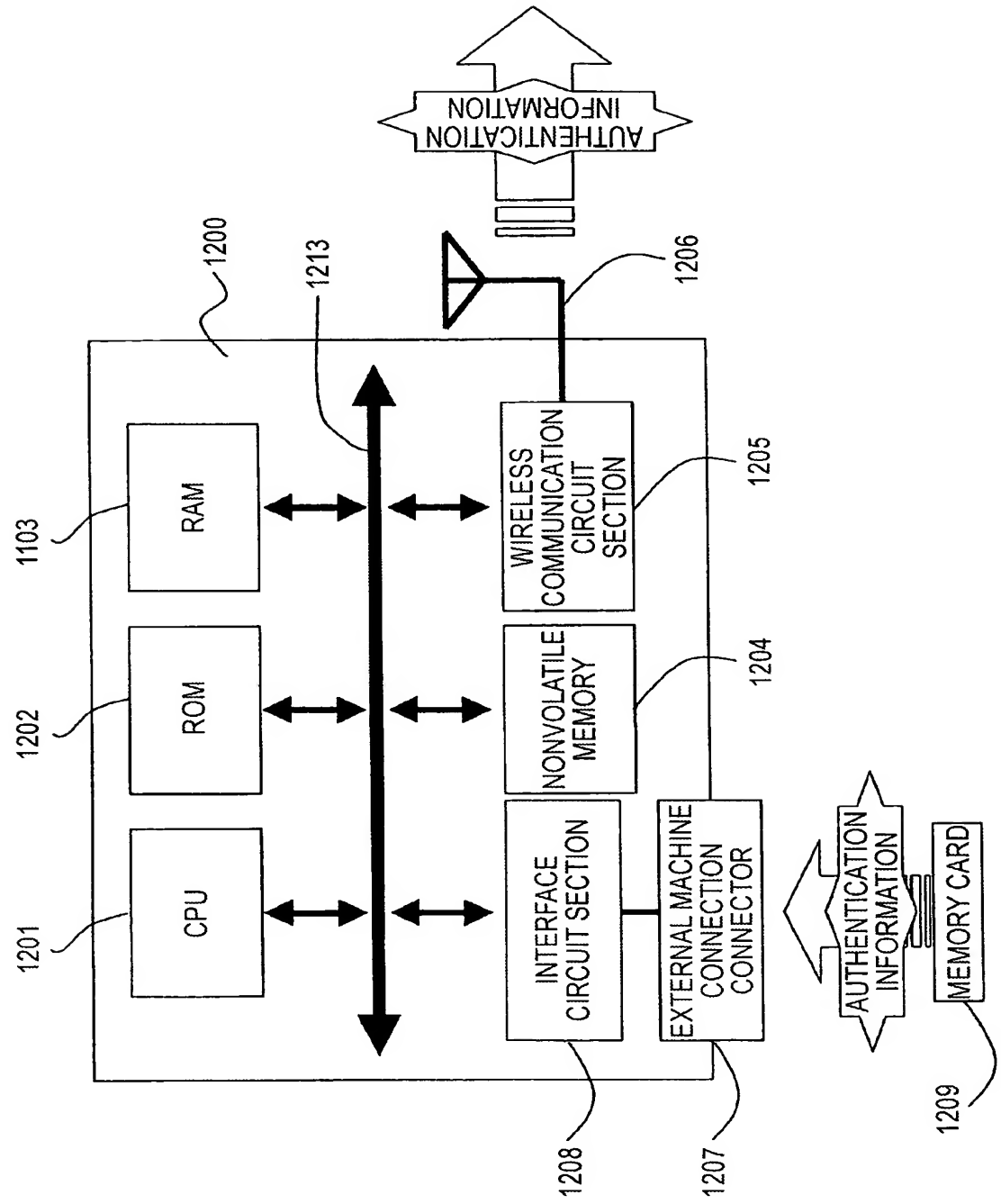

AUTHENTICATION INFORMATION
1200
1213
1206
1103
RAM
1202
ROM
1201
CPU
WIRELESS COMMUNICATION CIRCUIT SECTION
1205
NONVOLATILE MEMORY
1204
INTERFACE CIRCUIT SECTION
EXTERNAL MACHINE CONNECTION CONNECTOR
AUTHENTICATION INFORMATION
MEMORY CARD
1208
1207
1209

FIG. 17

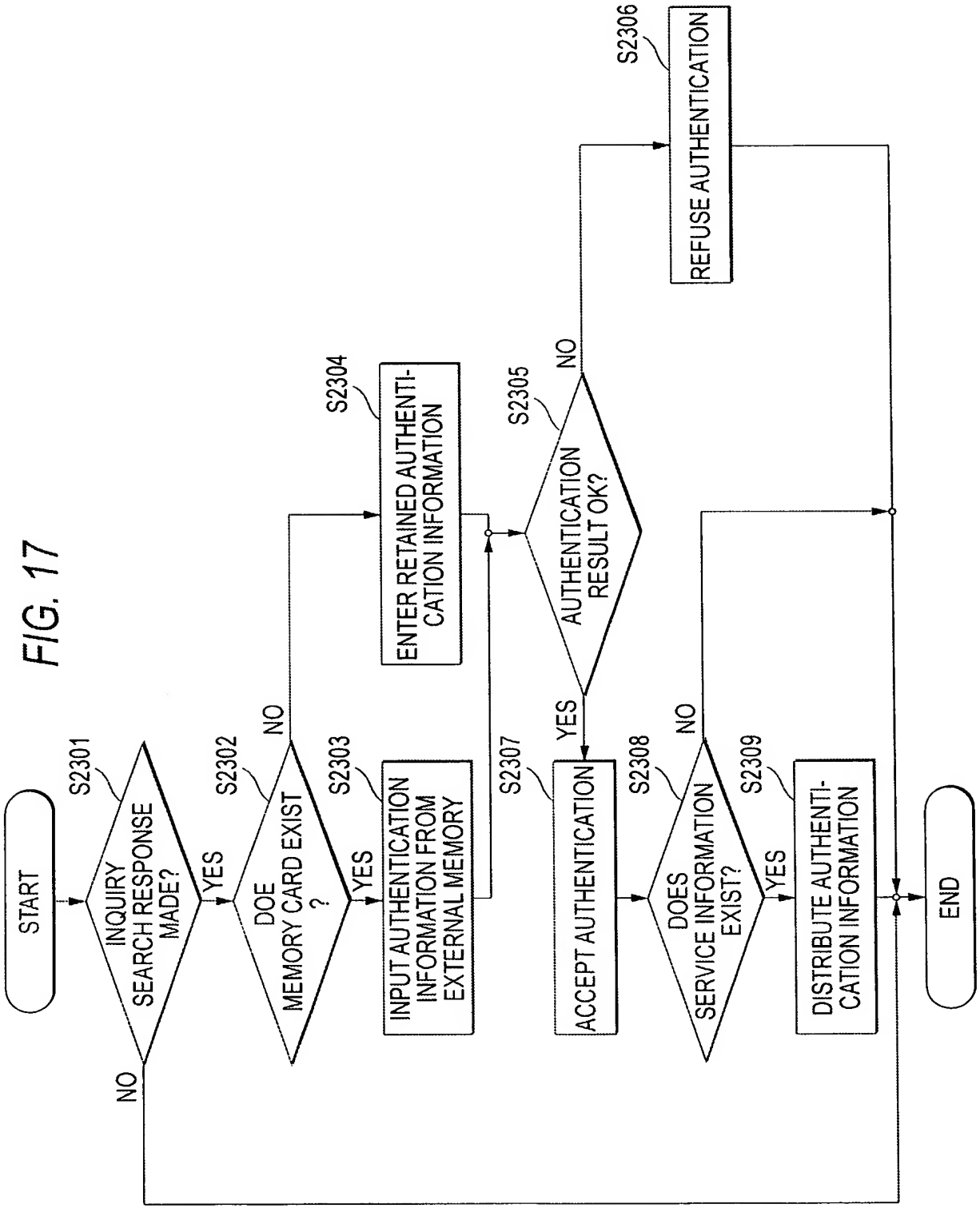

START
S2301
INQUIRY SEARCH RESPONSE MADE?
YES
NO
S2302
DOE MEMORY CARD EXIST ?
YES
NO
S2303
INPUT AUTHENTICATION INFORMATION FROM EXTERNAL MEMORY
S2304
ENTER RETAINED AUTHENTICATION INFORMATION
S2305
AUTHENTICATION RESULT OK?
YES
NO
S2306
REFUSE AUTHENTICATION
S2307
ACCEPT AUTHENTICATION
S2308
DOES SERVICE INFORMATION EXIST?
YES
NO
S2309
DISTRIBUTE AUTHENTICATION INFORMATION
END

FIG. 18

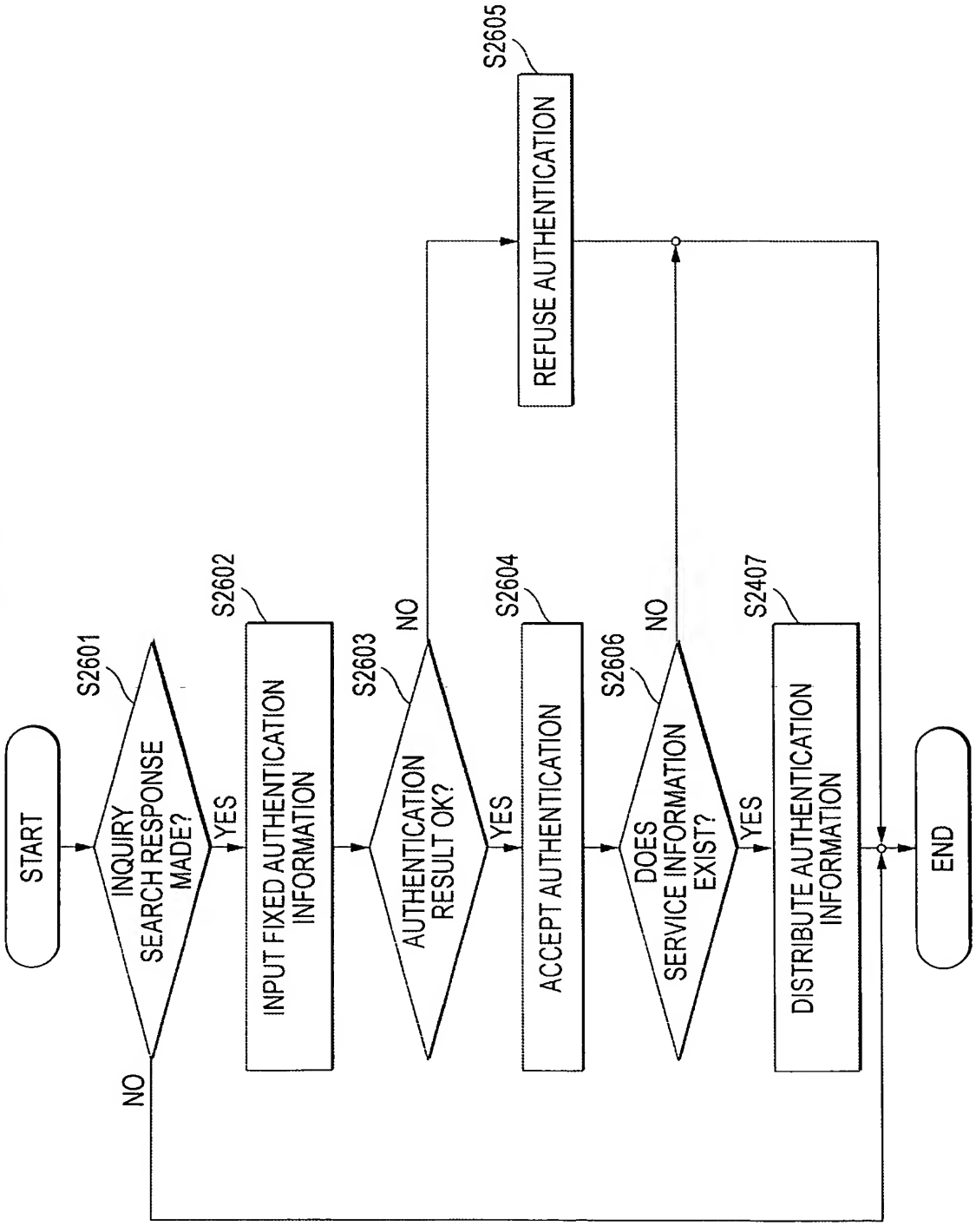

START
S2601
INQUIRY SEARCH RESPONSE MADE?
YES
NO
S2602
INPUT FIXED AUTHENTICATION INFORMATION
S2603
AUTHENTICATION RESULT OK?
YES
NO
S2604
ACCEPT AUTHENTICATION
S2605
REFUSE AUTHENTICATION
S2606
DOES SERVICE INFORMATION EXIST?
YES
NO
S2407
DISTRIBUTE AUTHENTICATION INFORMATION
END

FIG. 19

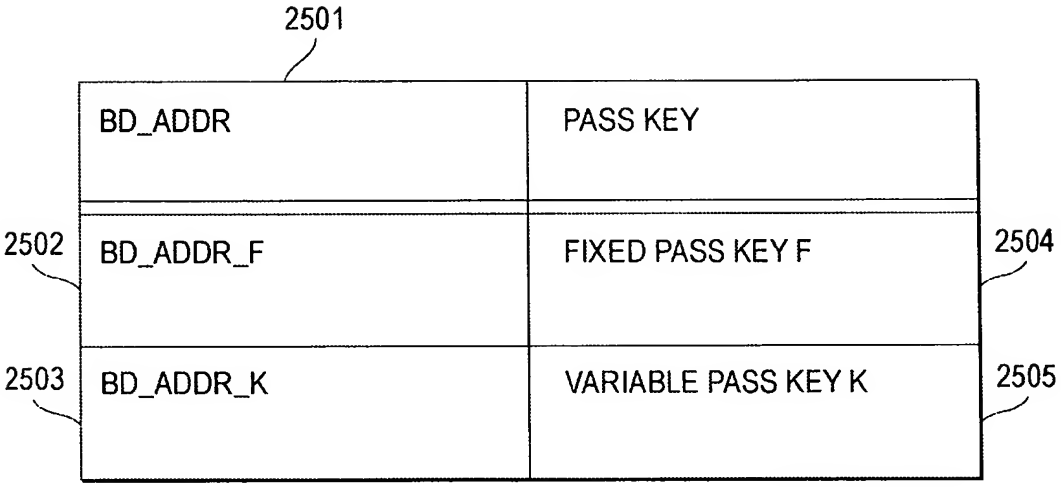

2501
BD_ADDR
PASS KEY
2502
BD_ADDR_F
FIXED PASS KEY F
2504
2503
BD_ADDR_K
VARIABLE PASS KEY K
2505

FIG. 20

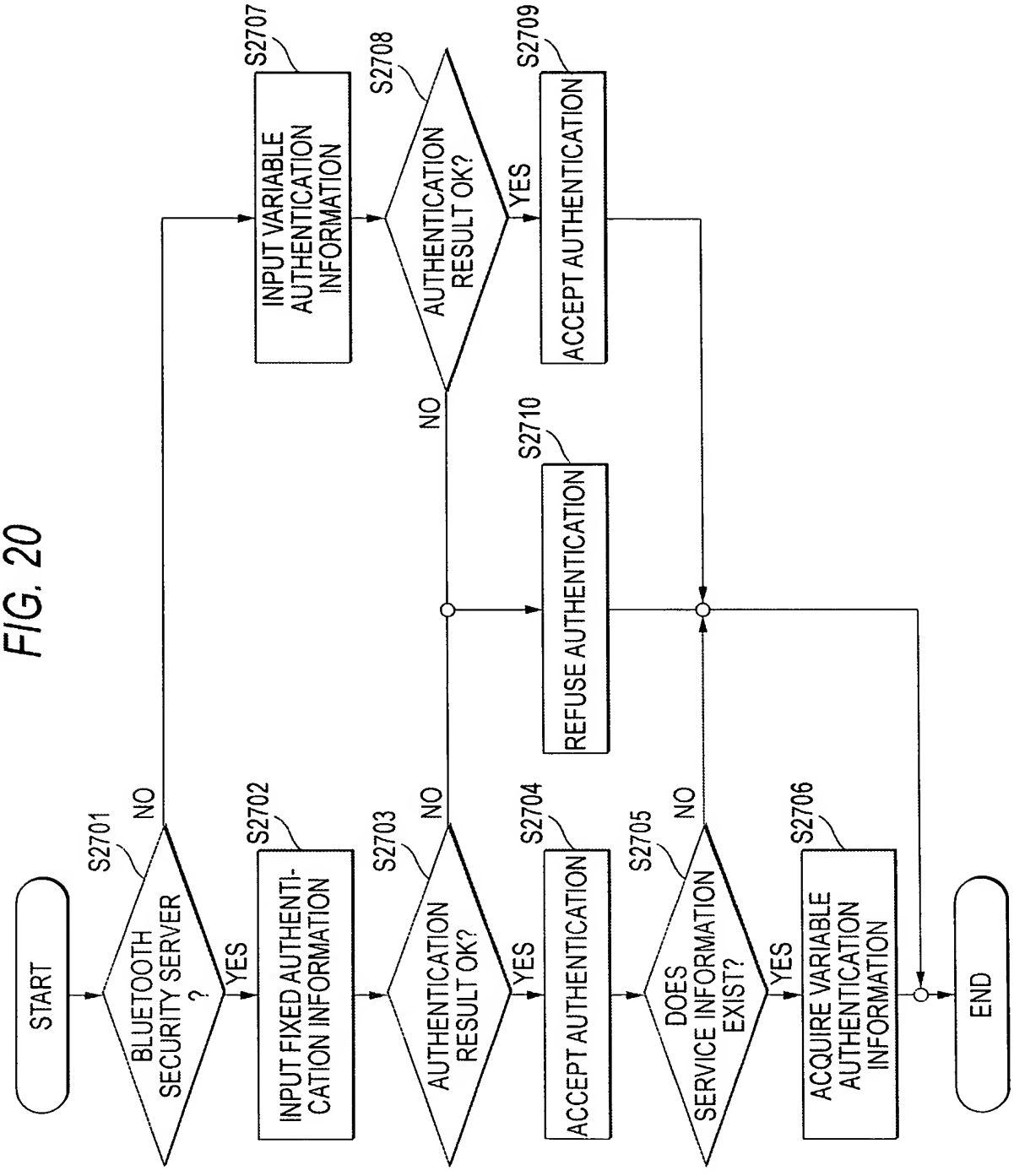

START
S2701
BLUETOOTH SECURITY SERVER ?
NO
YES
S2702
INPUT FIXED AUTHENTICATION INFORMATION
S2703
AUTHENTICATION RESULT OK?
NO
YES
S2704
ACCEPT AUTHENTICATION
S2705
DOES SERVICE INFORMATION EXIST?
NO
YES
S2706
ACQUIRE VARIABLE AUTHENTICATION INFORMATION
END
S2707
INPUT VARIABLE AUTHENTICATION INFORMATION
S2708
AUTHENTICATION RESULT OK?
NO
YES
S2709
ACCEPT AUTHENTICATION
S2710
REFUSE AUTHENTICATION

FIG. 21

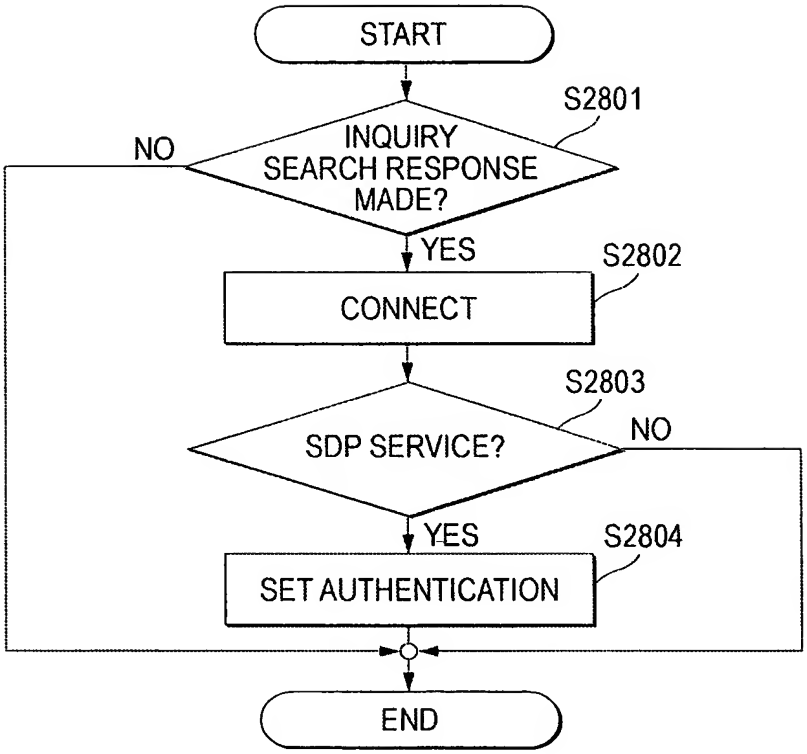

START
S2801
INQUIRY SEARCH RESPONSE MADE?
NO
YES
S2802
CONNECT
S2803
SDP SERVICE?
NO
YES
S2804
SET AUTHENTICATION
END

FIG. 22

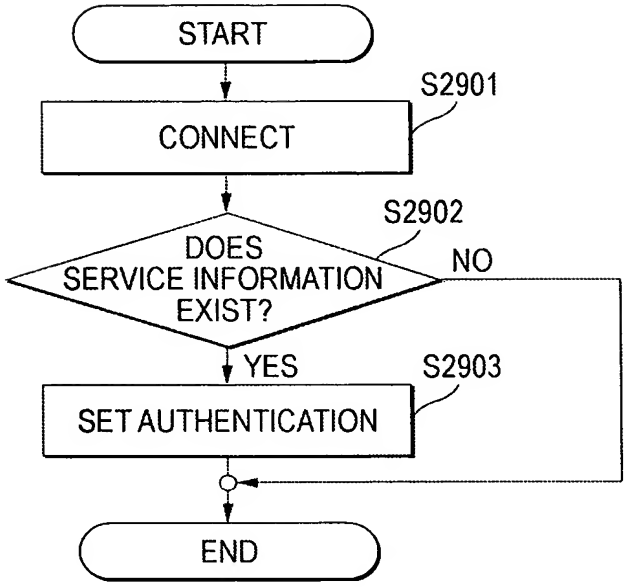
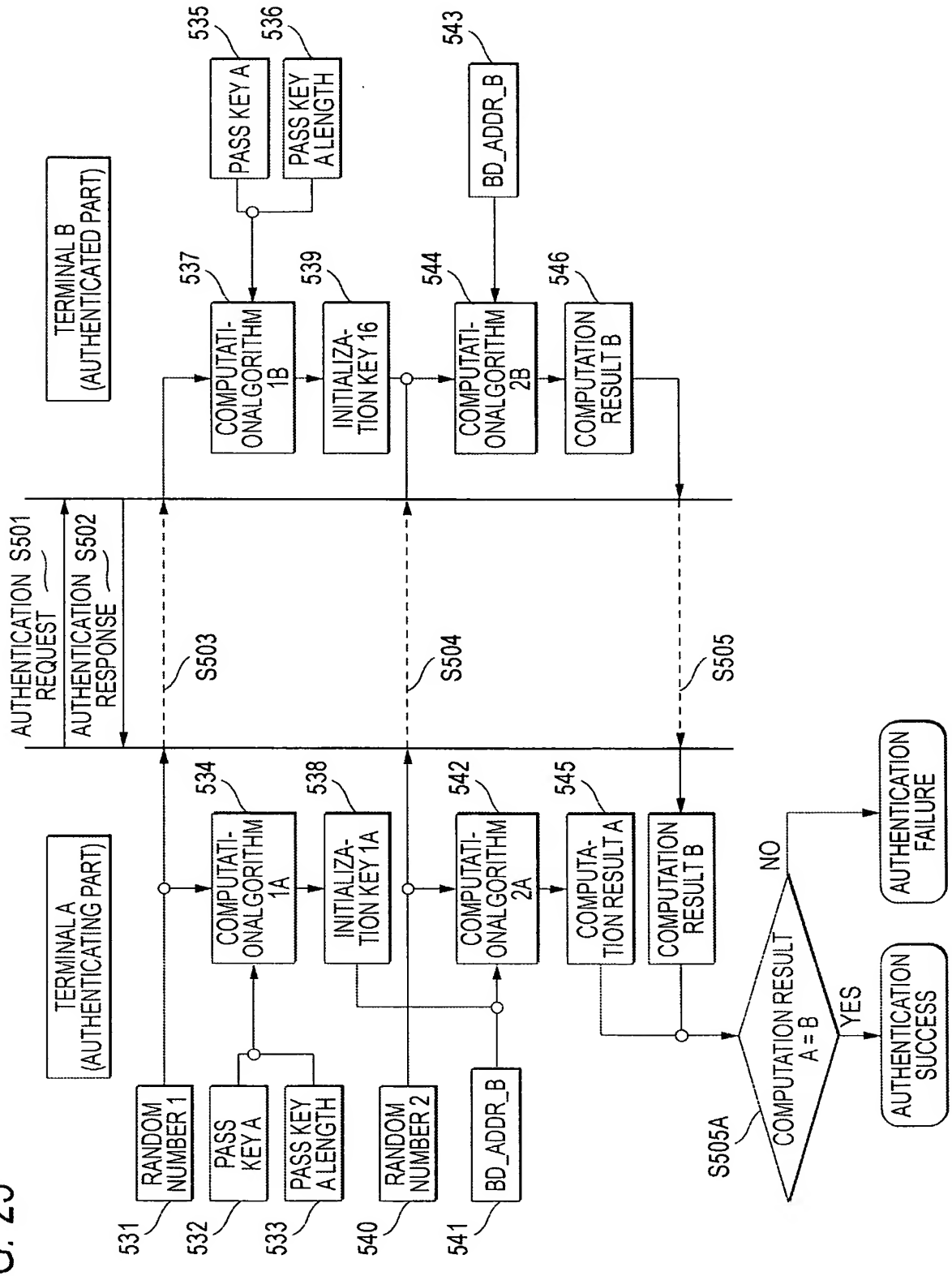

START
S2901
CONNECT
S2902
DOES SERVICE INFORMATION EXIST?
NO
YES
S2903
SET AUTHENTICATION
END

FIG. 23


TERMINAL A (AUTHENTICATING PART)
TERMINAL B (AUTHENTICATED PART)
AUTHENTICATION REQUEST S501
AUTHENTICATION RESPONSE S502
S503
S504
S505
RANDOM NUMBER 1
PASS KEY A
PASS KEY A LENGTH
RANDOM NUMBER 2
BD_ADDR_B
COMPUTATI-ONALGORITHM 1A
INITIALIZA-TION KEY 1A
COMPUTATI-ONALGORITHM 2A
COMPUTA-TION RESULT A
COMPUTATION RESULT B
PASS KEY A
PASS KEY A LENGTH
BD_ADDR_B
COMPUTATI-ONALGORITHM 1B
INITIALIZA-TION KEY 16
COMPUTATI-ONALGORITHM 2B
COMPUTATION RESULT B
S505A
COMPUTATION RESULT A = B
NO
YES
AUTHENTICATION FAILURE
AUTHENTICATION SUCCESS
531
532
533
540
541
534
538
542
545
535
536
543
537
539
544
546